

aaa gat cca agt gga tta tct gga gat gtt ctg ata aat gga gca ccg 336
Lys Asp Pro Ser Gly Leu Ser Gly Asp Val Leu Ile Asn Gly Ala Pro

| 100 | 105 | 110 | |
|---|-----|-----|-----|
| cga cct gcc aat ttc aaa tgt aat tca ggt tac gtg gta caa gat gat | | | 384 |
| Arg Pro Ala Asn Phe Lys Cys Asn Ser Gly Tyr Val Val Gln Asp Asp | | | |
| 115 | 120 | 125 | |
| gtt gtg atg ggc act ctg acg gtg aga gaa aac tta cag ttc tca gca | | | 432 |
| Val Val Met Gly Thr Leu Thr Val Arg Glu Asn Leu Gln Phe Ser Ala | | | |
| 130 | 135 | 140 | |
| gct ctt cgg ctt gca aca act atg acg aat cat gaa aaa aac gaa cgg | | | 480 |
| Ala Leu Arg Leu Ala Thr Thr Met Thr Asn His Glu Lys Asn Glu Arg | | | |
| 145 | 150 | 155 | 160 |
| att aac agg gtc att caa gag tta ggt ctg gat aaa gtg gca gac tcc | | | 528 |
| Ile Asn Arg Val Ile Gln Glu Leu Gly Leu Asp Lys Val Ala Asp Ser | | | |
| 165 | 170 | 175 | |
| aag gtt gga act cag ttt atc cgt ggt gtg tct gga gga gaa aga aaa | | | 576 |
| Lys Val Gly Thr Gln Phe Ile Arg Gly Val Ser Gly Gly Glu Arg Lys | | | |
| 180 | 185 | 190 | |
| agg act agt ata gga atg gag ctt atc act gat cct tcc atc ttg ttc | | | 624 |
| Arg Thr Ser Ile Gly Met Glu Leu Ile Thr Asp Pro Ser Ile Leu Phe | | | |
| 195 | 200 | 205 | |
| ttg gat gag cct aca act ggc tta gac tca agc aca gca aat gct gtc | | | 672 |
| Leu Asp Glu Pro Thr Thr Gly Leu Asp Ser Ser Thr Ala Asn Ala Val | | | |
| 210 | 215 | 220 | |
| ctt ttg ctc ctg aaa agg atg tct aag cag gga cga aca atc atc ttc | | | 720 |
| Leu Leu Leu Leu Lys Arg Met Ser Lys Gln Gly Arg Thr Ile Ile Phe | | | |
| 225 | 230 | 235 | 240 |
| tcc att cat cag cct cga tat tcc atc ttc aag ttg ttt gat agc ctc | | | 768 |
| Ser Ile His Gln Pro Arg Tyr Ser Ile Phe Lys Leu Phe Asp Ser Leu | | | |
| 245 | 250 | 255 | |
| acc tta ttg gcc tca gga aga ctt atg ttc cac ggg cct gct cag gag | | | 816 |
| Thr Leu Leu Ala Ser Gly Arg Leu Met Phe His Gly Pro Ala Gln Glu | | | |
| 260 | 265 | 270 | |
| gcc ttg gga tac ttt gaa tca gct ggt tat cac tgt gag gcc tat aat | | | 864 |
| Ala Leu Gly Tyr Phe Glu Ser Ala Gly Tyr His Cys Glu Ala Tyr Asn | | | |
| 275 | 280 | 285 | |
| aac cct gca gac ttc ttc ttg gac atc att aat gga gat tcc act gct | | | 912 |
| Asn Pro Ala Asp Phe Phe Leu Asp Ile Ile Asn Gly Asp Ser Thr Ala | | | |
| 290 | 295 | 300 | |
| gtg gca tta aac aga gaa gaa gac ttt aaa gcc aca gag atc ata gag | | | 960 |
| Val Ala Leu Asn Arg Glu Glu Asp Phe Lys Ala Thr Glu Ile Ile Glu | | | |

| 305 | 310 | 315 | 320 | |
|---|-----|-----|-----|------|
| cct tcc aag cag gat aag cca ctc ata gaa aaa tta gcg gag att tat | | | | 1008 |
| Pro Ser Lys Gln Asp Lys Pro Leu Ile Glu Lys Leu Ala Glu Ile Tyr | | | | |
| | 325 | 330 | 335 | |
| gtc aac tcc tcc ttc tac aaa gag aca aaa gct gaa tta cat caa ctt | | | | 1056 |
| Val Asn Ser Ser Phe Tyr Lys Glu Thr Lys Ala Glu Leu His Gln Leu | | | | |
| | 340 | 345 | 350 | |
| tcc ggg ggt gag aag aag aag aag atc aca gtc ttc aag gag atc agc | | | | 1104 |
| Ser Gly Gly Glu Lys Lys Lys Lys Ile Thr Val Phe Lys Glu Ile Ser | | | | |
| | 355 | 360 | 365 | |
| tac acc acc tcc ttc tgt cat caa ctc aga tgg gtt tcc aag cgt tca | | | | 1152 |
| Tyr Thr Thr Ser Phe Cys His Gln Leu Arg Trp Val Ser Lys Arg Ser | | | | |
| | 370 | 375 | 380 | |
| ttc aaa aac ttg ctg ggt aat ccc cag gcc tct ata gct cag atc att | | | | 1200 |
| Phe Lys Asn Leu Leu Gly Asn Pro Gln Ala Ser Ile Ala Gln Ile Ile | | | | |
| | 385 | 390 | 395 | 400 |
| gtc aca gtc gta ctg gga ctg gtt ata ggt gcc att tac ttt ggg cta | | | | 1248 |
| Val Thr Val Val Leu Gly Leu Val Ile Gly Ala Ile Tyr Phe Gly Leu | | | | |
| | 405 | 410 | 415 | |
| aaa aat gat tct act gga atc cag aac aga gct ggg gtt ctc ttc ttc | | | | 1296 |
| Lys Asn Asp Ser Thr Gly Ile Gln Asn Arg Ala Gly Val Leu Phe Phe | | | | |
| | 420 | 425 | 430 | |
| ctg acg acc aac cag tgt ttc agc agt gtt tca gcc gtg gaa ctc ttt | | | | 1344 |
| Leu Thr Thr Asn Gln Cys Phe Ser Ser Val Ser Ala Val Glu Leu Phe | | | | |
| | 435 | 440 | 445 | |
| gtg gta gag aag aag ctc ttc ata cat gaa tac atc agc gga tac tac | | | | 1392 |
| Val Val Glu Lys Lys Leu Phe Ile His Glu Tyr Ile Ser Gly Tyr Tyr | | | | |
| | 450 | 455 | 460 | |
| aga gtg tca tct tat ttc ctt gga aaa ctg tta tct gat tta tta ccc | | | | 1440 |
| Arg Val Ser Ser Tyr Phe Leu Gly Lys Leu Leu Ser Asp Leu Leu Pro | | | | |
| | 465 | 470 | 475 | 480 |
| atg agg atg tta cca agt att ata ttt acc tgt ata gtg tac ttc atg | | | | 1488 |
| Met Arg Met Leu Pro Ser Ile Ile Phe Thr Cys Ile Val Tyr Phe Met | | | | |
| | 485 | 490 | 495 | |
| tta gga ttg aag cca aag gca gat gcc ttc ttc gtt atg atg ttt acc | | | | 1536 |
| Leu Gly Leu Lys Pro Lys Ala Asp Ala Phe Phe Val Met Met Phe Thr | | | | |
| | 500 | 505 | 510 | |
| ctt atg atg gtg gct tat tca gcc agt tcc atg gca ctg gcc ata gca | | | | 1584 |
| Leu Met Met Val Ala Tyr Ser Ala Ser Ser Met Ala Leu Ala Ile Ala | | | | |

| 515 | 520 | 525 | |
|---|-----|-----|------|
| gca ggt cag agt gtg gtt tct gta gca aca ctt ctc atg acc atc tgt | | | 1632 |
| Ala Gly Gln Ser Val Val Ser Val Ala Thr Leu Leu Met Thr Ile Cys | | | |
| 530 | 535 | 540 | |
| ttt gtg ttt atg atg att ttt tca ggt ctg ttg gtc aat ctc aca acc | | | 1680 |
| Phe Val Phe Met Met Ile Phe Ser Gly Leu Leu Val Asn Leu Thr Thr | | | |
| 545 | 550 | 555 | 560 |
| att gca tct tgg ctg tca tgg ctt cag tac ttc agc att cca cga tat | | | 1728 |
| Ile Ala Ser Trp Leu Ser Trp Leu Gln Tyr Phe Ser Ile Pro Arg Tyr | | | |
| 565 | 570 | 575 | |
| gga ttt acg gct ttg cag cat aat gaa ttt ttg gga caa aac ttc tgc | | | 1776 |
| Gly Phe Thr Ala Leu Gln His Asn Glu Phe Leu Gly Gln Asn Phe Cys | | | |
| 580 | 585 | 590 | |
| cca gga ctc aat gca aca gga aac aat cct tgt aac tat gca aca tgt | | | 1824 |
| Pro Gly Leu Asn Ala Thr Gly Asn Asn Pro Cys Asn Tyr Ala Thr Cys | | | |
| 595 | 600 | 605 | |
| act ggc gaa gaa tat ttg gta aag cag ggc atc gat ctc tca ccc tgg | | | 1872 |
| Thr Gly Glu Glu Tyr Leu Val Lys Gln Gly Ile Asp Leu Ser Pro Trp | | | |
| 610 | 615 | 620 | |
| ggc ttg tgg aag aat cac gtg gcc ttg gct tgt atg att gtt att ttc | | | 1920 |
| Gly Leu Trp Lys Asn His Val Ala Leu Ala Cys Met Ile Val Ile Phe | | | |
| 625 | 630 | 635 | 640 |
| ctc aca att gcc tac ctg aaa ttg tta ttt ctt aaa aaa tat tct taa | | | 1968 |
| Leu Thr Ile Ala Tyr Leu Lys Leu Leu Phe Leu Lys Lys Tyr Ser | | | |
| 645 | 650 | 655 | |

<210> 2
 <211> 655
 <212> PRT
 <213> Homo sapiens

<400> 2

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ser | Ser | Ser | Asn | Val | Glu | Val | Phe | Ile | Pro | Val | Ser | Gln | Gly | Asn |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Asn | Gly | Phe | Pro | Ala | Thr | Ala | Ser | Asn | Asp | Leu | Lys | Ala | Phe | Thr |
| | | 20 | | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Gly | Ala | Val | Leu | Ser | Phe | His | Asn | Ile | Cys | Tyr | Arg | Val | Lys | Leu |
| | | 35 | | | | | | 40 | | | | 45 | | | |

Lys Ser Gly Phe Leu Pro Cys Arg Lys Pro Val Glu Lys Glu Ile Leu
 50 55 60

Ser Asn Ile Asn Gly Ile Met Lys Pro Gly Leu Asn Ala Ile Leu Gly
 65 70 75 80

Pro Thr Gly Gly Gly Lys Ser Ser Leu Leu Asp Val Leu Ala Ala Arg
 85 90 95

Lys Asp Pro Ser Gly Leu Ser Gly Asp Val Leu Ile Asn Gly Ala Pro
 100 105 110

Arg Pro Ala Asn Phe Lys Cys Asn Ser Gly Tyr Val Val Gln Asp Asp
 115 120 125

Val Val Met Gly Thr Leu Thr Val Arg Glu Asn Leu Gln Phe Ser Ala
 130 135 140

Ala Leu Arg Leu Ala Thr Thr Met Thr Asn His Glu Lys Asn Glu Arg
 145 150 155 160

Ile Asn Arg Val Ile Gln Glu Leu Gly Leu Asp Lys Val Ala Asp Ser
 165 170 175

Lys Val Gly Thr Gln Phe Ile Arg Gly Val Ser Gly Gly Glu Arg Lys
 180 185 190

Arg Thr Ser Ile Gly Met Glu Leu Ile Thr Asp Pro Ser Ile Leu Phe
 195 200 205

Leu Asp Glu Pro Thr Thr Gly Leu Asp Ser Ser Thr Ala Asn Ala Val
 210 215 220

Leu Leu Leu Leu Lys Arg Met Ser Lys Gln Gly Arg Thr Ile Ile Phe
 225 230 235 240

Ser Ile His Gln Pro Arg Tyr Ser Ile Phe Lys Leu Phe Asp Ser Leu
 245 250 255

Thr Leu Leu Ala Ser Gly Arg Leu Met Phe His Gly Pro Ala Gln Glu
260 265 270

Ala Leu Gly Tyr Phe Glu Ser Ala Gly Tyr His Cys Glu Ala Tyr Asn
275 280 285

Asn Pro Ala Asp Phe Phe Leu Asp Ile Ile Asn Gly Asp Ser Thr Ala
290 295 300

Val Ala Leu Asn Arg Glu Glu Asp Phe Lys Ala Thr Glu Ile Ile Glu
305 310 315 320

Pro Ser Lys Gln Asp Lys Pro Leu Ile Glu Lys Leu Ala Glu Ile Tyr
325 330 335

Val Asn Ser Ser Phe Tyr Lys Glu Thr Lys Ala Glu Leu His Gln Leu
340 345 350

Ser Gly Gly Glu Lys Lys Lys Lys Ile Thr Val Phe Lys Glu Ile Ser
355 360 365

Tyr Thr Thr Ser Phe Cys His Gln Leu Arg Trp Val Ser Lys Arg Ser
370 375 380

Phe Lys Asn Leu Leu Gly Asn Pro Gln Ala Ser Ile Ala Gln Ile Ile
385 390 395 400

Val Thr Val Val Leu Gly Leu Val Ile Gly Ala Ile Tyr Phe Gly Leu
405 410 415

Lys Asn Asp Ser Thr Gly Ile Gln Asn Arg Ala Gly Val Leu Phe Phe
420 425 430

Leu Thr Thr Asn Gln Cys Phe Ser Ser Val Ser Ala Val Glu Leu Phe
435 440 445

Val Val Glu Lys Lys Leu Phe Ile His Glu Tyr Ile Ser Gly Tyr Tyr
450 455 460

Arg Val Ser Ser Tyr Phe Leu Gly Lys Leu Leu Ser Asp Leu Leu Pro
 465 470 475 480

Met Arg Met Leu Pro Ser Ile Ile Phe Thr Cys Ile Val Tyr Phe Met
 485 490 495

Leu Gly Leu Lys Pro Lys Ala Asp Ala Phe Phe Val Met Met Phe Thr
 500 505 510

Leu Met Met Val Ala Tyr Ser Ala Ser Ser Met Ala Leu Ala Ile Ala
 515 520 525

Ala Gly Gln Ser Val Val Ser Val Ala Thr Leu Leu Met Thr Ile Cys
 530 535 540

Phe Val Phe Met Met Ile Phe Ser Gly Leu Leu Val Asn Leu Thr Thr
 545 550 555 560

Ile Ala Ser Trp Leu Ser Trp Leu Gln Tyr Phe Ser Ile Pro Arg Tyr
 565 570 575

Gly Phe Thr Ala Leu Gln His Asn Glu Phe Leu Gly Gln Asn Phe Cys
 580 585 590

Pro Gly Leu Asn Ala Thr Gly Asn Asn Pro Cys Asn Tyr Ala Thr Cys
 595 600 605

Thr Gly Glu Glu Tyr Leu Val Lys Gln Gly Ile Asp Leu Ser Pro Trp
 610 615 620

Gly Leu Trp Lys Asn His Val Ala Leu Ala Cys Met Ile Val Ile Phe
 625 630 635 640

Leu Thr Ile Ala Tyr Leu Lys Leu Leu Phe Leu Lys Lys Tyr Ser
 645 650 655

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<220>
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<210> 5
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<210> 7
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20

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20

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aaagggtaaa attacgtggg 20

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gcaaacaac tgacgttttc 20

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ctggctgaca cttctttcac

20

<210> 21

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atgtattgtc acctagtgtt tg

22

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<400> 59

tgccctgtagc tcttcacatc

20

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<223> Exon 13 antisense primer

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ataagggcaa agaggaaagt

20

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<223> Exon 14 sense primer

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tttgctcttc ctttaaaacc g

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25